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NEW RECORDS OF CRABRONIDAE (HYMENOPTERA: APOIDEA: SPHECIFORMES) FROM THE FARS PROVINCE, IRAN

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Summary. An annotated list of 13 species of digger wasps (Hymenoptera: Crabronidae) from eight genera collected in the Fars Province of Iran is presented. Seven species, *Belomicrus italicus* A. Costa, 1871, *Liris agilis* (F. Smith, 1856), *L. maidli* (Arnold, 1929), *Miscophus albufeirae* de Andrade, 1952, *Oxybelus phyllophorus* Kohl, 1898, *Prosopigastra major* (F. Morawitz, 1890) and *Trypoxylon kolazyi* Kohl, 1893, are new records for Iran. Moreover, six species, *Crossocerus vagabundus* (Panzer, 1798), *Ectemnius cephalotes* (Olivier, 1792), *Liris atratus* (Spinola, 1805), *L. braueri* Kohl, 1884, *L. haemorrhoidalis* (Fabricius, 1804), *Trypoxylon clavicerum* Lepeletier de Saint-Fargeau et Audinet Serville, 1828, are new records for the Fars Province.

Key words: Hymenoptera, Aculeata, digger wasps, fauna, new records, Iran.

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Резюме. Приводится аннотированный список 13 видов роющих ос (Hymenoptera: Crabronidae) из 9 родов, собранных в иранской провинции Фарс. Впервые для Ирана указываются семь видов: *Belomicrus italicus* A. Costa, 1871, *Liris agilis* (F. Smith, 1856), *L. maidli* (Arnold, 1929), *Miscophus albufeirae* de Andrade, 1952, *Oxybelus phyllophorus* Kohl, 1898, *Prosopigastra major* (F. Morawitz, 1890) и *Trypoxylon kolazyi* Kohl, 1893. Новыми для провинции Фарс являются 6 видов: *Crossocerus vagabundus* (Panzer, 1798), *Ectemnius cephalotes* (Olivier, 1792), *Liris atratus* (Spinola, 1805), *L. braueri* Kohl, 1884, *L. haemorrhoidalis* (Fabricius, 1804) и *Trypoxylon clavicerum* Lepeletier de Saint-Fargeau et Audinet Serville, 1828.

INTRODUCTION

Until about two decades ago, studies dedicated totally to Iranian digger wasps (Hymenoptera, Crabronidae) were rare (e.g., Gussakovskij, 1933; de Beaumont, 1957, 1970); in most cases data on Iranian wasps were dispersed in papers dealing with other parts of the world, or

in revisionary works. A complete bibliography on these wasps can be found in the web electronic database "Catalogue of Sphecidae *sensu lato*" (Pulawski, 2020).

In recent years, a number of local authors have focused on Iranian digger wasps, and as a result, our knowledge of these insects has gradually increased (Ebrahimi, 2005, 2014; Fallahzadeh *et al.*, 2009, 2018; Sadeghi *et al.*, 2019; Rezaei *et al.*, 2020).

The aim of the present paper is to provide information on the newly discovered crabronid wasps in the Fars Province, and thus to make an additional contribution to the knowledge of the Iranian wasp fauna.

MATERIAL AND METHODS

Sampling was done using Malaise traps in different localities of the Fars Province in southern Iran. Collected specimens were pinned, identified and are deposited at the Insect Collection of Jahrom Branch, Islamic Azad University, Iran (JIAU) and the Institute of Biodiversity and Ecosystem Research, Sofia, Bulgaria (IBER). Taxonomy of genera, nomenclature and distribution of species are based mainly on Antropov *et al.* (2017) and Pulawski (2020). New records are asterisked (*).

NEW RECORDS

Belomicrus italicus A. Costa, 1871

MATERIAL EXAMINED. 1♀, Iran, Fars Province, Kazeroon (Zavali), 29°32'53"N, 51°46'23"E, 829m a. s. l., 2.vi.2017-1.ix.2017, leg. M. Sadeghi.

DISTRIBUTION. *Iran: Fars (new record). – Central Asia, southern Europe, Palestine, Tunisia, Turkey.

Crossocerus vagabundus (Panzer, 1798)

MATERIAL EXAMINED. Iran: Fars Province, Shiraz (Bustan-e Jannat), 29°36'52"N, 52°28'09"E, 1584 m, 1–9.VI 2019, 1♀, leg. Sh. Rezaei.

DISTRIBUTION. Iran: East Azerbaijan, West Azerbaijan, Gilan, *Fars (first record). – China, Europe, India, Japan, Kazakhstan, Korean Peninsula, Mongolia, North Africa, Russia, Turkey, Uzbekistan.

Ectemnius (Metacrabro) cephalotes (Olivier, 1792)

MATERIAL EXAMINED. Iran: Fars Province, Shiraz (Bustan-e Jannat), 29°36'52"N, 52°28'09"E, 1584 m, 17–23.VII 2018, 1♂, leg. Sh. Rezaei.

DISTRIBUTION. Iran: Kermanshah, *Fars (first record). – Europe, Russia, Kazakhstan, North Africa, Syria, Turkey, North America.

Liris (Leptolarra) agilis (F. Smith, 1856)

MATERIAL EXAMINED. Iran: Fars Province, Larestan (Baen), 27°39'54"N, 54°16'39"E, 914 m, 5–9.IV 2018, 1♂, leg. Sh. Rezaei.

DISTRIBUTION. *Iran: Fars (new record). – Canary Islands, China, Egypt, Gambia, Israel, Kuwait, Libya, Malta, Mauritania, Morocco, Oman, Sudan, United Arab Emirates.

Liris (Leptolarra) atratus (Spinola, 1805)

MATERIAL EXAMINED. Iran: Fars Province, Kavar, 29°11'52"N, 52°42'06"E, 1547 m, 27.VII–5.VIII 2019, 1♂, leg. Sh. Rezaei.

DISTRIBUTION. Iran: Tehran, *Fars (first record). – Afghanistan, Algeria, Chad, Egypt, France, Greece, Iraq, Italy, Jordan, Libya, Morocco, Pakistan, Portugal, Spain, Tunisia, Turkey.

Liris (Leptolarra) maidli (Arnold, 1929)

MATERIAL EXAMINED. Iran: Fars Province, Larestan (Hormood Abbsi), 27°32'06"N, 54°59'02"E, 29.V–29.VI 2015, 1♀, leg. Sh. Rezaei; Estahban (Mobarak Abad), 29°15'14"N, 53°56'46"E, 1573 m, 4.VIII–30.IX 2017, 1♂, leg. M. Sadeghi.

DISTRIBUTION. *Iran: Fars (new record). – Sudan, United Arab Emirates.

REMARKS. *Liris maidli* was originally described from a single male from Sudan. Recently, Schmid-Egger (2014) reported both male and female of this species from the United Arab Emirates. Iran represents the north-easternmost record of this species.

Liris (Liris) braueri Kohl, 1884

MATERIAL EXAMINED. Iran: Fars Province, Estahban (Mobarak Abad), 29°15'14"N, 53°56'46"E, 1573 m, 4.VIII–30.IX 2017, 1♀, leg. M. Sadeghi; Dalin, 30°02'15.0"N, 52°07'54.7"E, 2019 m, 5–21.V 2018, 1♀, leg. Sh. Rezaei

DISTRIBUTION. Iran: Sistan-o Baluchestan, Hormozgan, *Fars (first record). – Egypt, Israel, Kazakhstan, Oman, Palestine, Saudi Arabia, Sri Lanka, United Arab Emirates.

Liris (Liris) haemorrhoidalis (Fabricius, 1804)

MATERIAL EXAMINED. Iran: Fars Province, Estahban (Mobarak Abad), 29°15'14"N, 53°56'46"E, 1573 m, 4.VIII–30.IX 2017, 1♀, leg. M. Sadeghi.

DISTRIBUTION. Iran: Sistan-o Baluchestan, Bushehr, Tehran, *Fars (first record). – Afghanistan, Africa, Canary Islands, Kazakhstan, India, Iraq, Israel, Oman, Palestine, Saudi Arabia, Spain, United Arab Emirates, Yemen.

Miscophus albufeirae de Andrade, 1952

MATERIAL EXAMINED. Iran: Fars Province, Larestan (Hormood Abbsi), 27°32'06"N, 54°59'02"E, 506 m, 4–24.IX 2019, 2♂, leg. Sh. Rezaei; Larestan (Karmostaj), 27°31'55"N, 54°26'01"E, 781 m, 28.VIII–24.IX 2019, 1♂, leg. Sh. Rezaei.

DISTRIBUTION. *Iran: Fars (new record). – Cyprus, France, Greece, Hungary, Kyrgyzstan, Portugal, Russia, Spain, Turkey.

Oxybelus phyllophorus Kohl, 1898

MATERIAL EXAMINED. Iran: Fars Province, Larestan (Karmostaj), 27°31'55"N, 54°26'01"E, 781 m, 21–30.IV 2018, 1♀, leg. Sh. Rezaei.

DISTRIBUTION. *Iran: Fars (new record). – North Africa, United Arab Emirates.

Prosopigastra major (F. Morawitz, 1890)

MATERIAL EXAMINED. Iran: Fars Province, Shiraz (Bustan-e Jannat), 29°36'52"N, 52°28'09"E, 1584 m, 21–31.VIII 2019, 1♀, leg. Sh. Rezaei.

DISTRIBUTION. *Iran: Fars (new record). – Egypt, Israel, Kazakhstan, Morocco, Saudi Arabia, Sudan, Turkmenistan.

***Trypoxylon clavicerum* Lepeletier de Saint-Fargeau et Audinet Serville, 1828**

MATERIAL EXAMINED. Iran: Fars Province, Shiraz (Bustan-e Jannat), 29°36'52"N, 52°28'09"E, 1584 m, 1–10.VI 2019, 1♀, leg. Sh. Rezaei; Zafar Abad, 29°24'06"N, 52°35'01"E, 1514 m, 1–7.X 2019, 1♀, leg. Sh. Rezaei.

DISTRIBUTION. Iran: East Azerbaijan, Ilam, Tehran, *Fars (first record). – Europe, North Africa, Georgia, Israel, Japan, Kazakhstan, North America, Russia, Turkey.

***Trypoxylon kolazyi* Kohl, 1893**

MATERIAL EXAMINED. Iran: Fars Province, Dalin, 30°02'15.0"N, 52°07'54.7"E, 2019 m, 3–11.V 2019, 1♀, leg. Sh. Rezaei; same locality, 8–18.VI 2019, 2♀, leg. Sh. Rezaei; Zafar Abad, 29°24'06"N, 52°35'01"E, 1514 m, 18–25.VI 2019, 1♀, leg. Sh. Rezaei.

DISTRIBUTION. *Iran: Fars (new record). – Europe, Georgia, Kazakhstan, Uzbekistan, Russia, Turkey, North America.

DISCUSSION

Recently, Jahantigh *et al.* (2017) listed 315 species of Crabronidae from Iran and 125 from the Fars Province. Based on recent molecular and phylogenetic study, Sann *et al.* (2018) demonstrated the polyphyletic nature of the digger wasp family Crabronidae, and they suggested splitting it into eight families: Ammoplanidae, Astatidae, Bembecidae, Crabronidae, Mellinidae, Pemphredonidae, Philanthidae, and Psenidae. In the current paper, however, Crabronidae are interpreted in the traditional sense. As a result of this paper, seven species of digger wasp have been recorded for Iran for the first time and new provincial records have been provided for six species. The results of the previous studies and the current paper revealed the high species diversity in the digger wasp fauna of the Fars Province. Currently, there are about 181 species known from the Fars Province. With addition results of the present paper and previous works, the number of digger wasps known from Iran is raised up to 364 species.

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